Complete Summary

GUIDELINE TITLE

Guidelines for dosimetry and calibration in ultraviolet radiation therapy: a report of a British Photodermatology Group workshop.

BIBLIOGRAPHIC SOURCE(S)

Taylor DK, Anstey AV, Coleman AJ, Diffey BL, Farr PM, Ferguson J, Ibbotson S, Langmack K, Lloyd JJ, McCann P, Martin CJ, Menage Hdu P, Moseley H, Murphy G, Pye SD, Rhodes LE, Rogers S. Guidelines for dosimetry and calibration in ultraviolet radiation therapy: a report of a British Photodermatology Group workshop. Br J Dermatol 2002 May;146(5):755-63. [19 references] PubMed

GUIDELINE STATUS

This is the current release of the guideline.

COMPLETE SUMMARY CONTENT

SCOPE

DISEASE/CONDITION(S)

All dermatological conditions that require ultraviolet radiation therapy

GUIDELINE CATEGORY

Treatment

CLINICAL SPECIALTY

Dermatology

INTENDED USERS

Allied Health Personnel
Nurses
Physicians

GUIDELINE OBJECTIVE(S)

To provide recommendations for good practice on preferred measurement techniques and standard methods of dosimetry for ultraviolet radiation applied to dermatological treatments

TARGET POPULATION

All patients undergoing ultraviolet radiation therapy

INTERVENTIONS AND PRACTICES CONSIDERED

Use and Assessment of Equipment

1. Ultraviolet (UV) radiometer
2. Spectroradiometer as calibration standard
3. Calibration of UV radiometer

Dosimetry

1. Measurement of body surface irradiance
    - Direct method (with a whole-body cabin occupant)
    - Indirect method (without a whole-body cabin occupant)
2. Use of built-in cabin dosimeters, including regular adjustments to avoid errors
3. Calculation and recording of patients UV radiation dose
4. Estimation of minimal erythema dose (MED)
5. Estimation of minimal phototoxic dose (MPD)

MAJOR OUTCOMES CONSIDERED

- Irradiance values
- Factors affecting irradiance values
- Accuracy of measurements

METHODOLOGY

METHODS USED TO COLLECT/SELECT EVIDENCE

Searches of Electronic Databases
Searches of Unpublished Data

DESCRIPTION OF METHODS USED TO COLLECT/SELECT THE EVIDENCE

Not stated

NUMBER OF SOURCE DOCUMENTS

Not stated

METHODS USED TO ASSESS THE QUALITY AND STRENGTH OF THE EVIDENCE

Weighting According to a Rating Scheme (Scheme Given)

RATING SCHEME FOR THE STRENGTH OF THE EVIDENCE

Levels of Evidence

I: Evidence obtained from at least one properly designed, randomized controlled trial

II-I: Evidence obtained from well designed controlled trials without randomization

II-ii: Evidence obtained from well designed cohort or case-control analytic studies, preferably from more than one centre or research group.

II-iii: Evidence obtained from multiple time series with or without the intervention. Dramatic results in uncontrolled experiments (such as the introduction of penicillin treatment in the 1940s) could also be regarded as this type of evidence.

III: Opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees

IV: Evidence inadequate owing to problems of methodology (e.g., sample size, or length or comprehensiveness of follow-up or conflicts of evidence)

METHODS USED TO ANALYZE THE EVIDENCE

Review

DESCRIPTION OF THE METHODS USED TO ANALYZE THE EVIDENCE

Not stated

METHODS USED TO FORMULATE THE RECOMMENDATIONS

Expert Consensus

DESCRIPTION OF METHODS USED TO FORMULATE THE RECOMMENDATIONS

These guidelines on recommendations for good practice have been prepared for medical physicists, dermatologists, and phototherapists, following a Workshop meeting of the British Photodermatology Group.

RATING SCHEME FOR THE STRENGTH OF THE RECOMMENDATIONS

Recommendation Grades

A. There is good evidence to support the use of the procedure.
B. There is fair evidence to support the use of the procedure.
C. There is poor evidence to support the use of the procedure.
D. There is fair evidence to support the rejection of the use of the procedure.
E. There is good evidence to support the rejection of the use of the procedure.

COST ANALYSIS

A formal cost analysis was not performed and published cost analyses were not reviewed.

METHOD OF GUIDELINE VALIDATION

Internal Peer Review

DESCRIPTION OF METHOD OF GUIDELINE VALIDATION

Draft guidelines are edited by the Therapy Guidelines and Audit Sub-committee (TGA) and subsequently returned to the task force for revision. The approved draft version is published in the quarterly British Association of Dermatologists (BAD) newsletter, and all BAD members are given the opportunity to respond, positively or negatively, but hopefully helpfully, within three months of publication. Finalised guidelines are approved by the TGA and the Executive Committee of the BAD and finally published in the British Journal of Dermatology.

RECOMMENDATIONS

MAJOR RECOMMENDATIONS

The levels of evidence (I-IV) and strength of recommendation ratings (A-E) are defined at the end of the "Major Recommendations" field.

1. Whole-body treatments should be given in ventilated cabins surrounding the patient with radiation sources wherever possible, and it is recommended that obsolete apparatus be replaced (BIII).
2. Phototherapy clinics should use an ultraviolet (UV) radiometer to measure irradiances from all UV treatment equipment. The meter should have minimal response outside the UV band and be chosen for dynamic range, linearity, and angular sensitivity (BIII).
3. The meter should be calibrated annually for each type of UV source in use, identifying the method, its traceability to known national standards, and the waveband over which irradiance is measured. Irradiance over the full UV band of 250-400 nm should also be measured, in addition to any other band width, to facilitate intercomparisons (BIII).
4. Built-in UV dosimeters in cabins should agree closely with directly measured irradiance values. Where agreement is outside reasonable tolerance ($\pm$10%),

the built-in meter may need adjusting. The supplier or the person responsible for the equipment should be consulted for advice (BIII).

5. Electrical equipment should be tested for compliance with electrical safety standards, and staff should be trained to operate the equipment correctly. Annual checks are acceptable, and written records should be kept (BIII).
6. Regular consistency checks of all UV irradiation apparatus should be performed, by checking for failed lamps and measuring UV irradiance in a standard reference location to identify any changes. Failed lamps should be replaced promptly, and consistency verified at least monthly (BIII).
7. Skin irradiances should be measured regularly by the Direct or Indirect Methods, and used to calculate exposure times and to check built-in meters. Measurement every 25-50 hours of usage is acceptable, but after installing new lamps, which degrade more quickly when new, remeasure after 10-15 hours (BIII).
8. Patient doses should be prescribed in J/cm^2 (or derived units), and cumulative doses calculated and recorded at the end of treatment courses, to quantify lifetime exposure to therapeutic UV (BII-i).
9. Minimal erythema dose/minimal phototoxic dose (MED/MPD) techniques should be described fully, including the site(s) of test(s), the criteria used to assess erythema, the methodology of masking and exposing test sites, including any devices used for this, and the sequence of doses used (or the ratio between adjacent exposures) (BII-iii).
10. The recommendations in this report should be subject to routine audit, as part of the clinic's audit programme, to verify that objectives are being met, and to optimize clinical outcomes.

Definitions:

Levels of Evidence

I: Evidence obtained from at least one properly designed, randomized controlled trial

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III: Opinions of respected authorities based on clinical experience, descriptive studies, or reports of expert committees

IV: Evidence inadequate owing to problems of methodology (e.g., sample size, or length or comprehensiveness of follow-up or conflicts of evidence)

Recommendation Grades (American Joint Committee on Cancer Classifications)

A. There is good evidence to support the use of the procedure.
B. There is fair evidence to support the use of the procedure.
C. There is poor evidence to support the use of the procedure.
D. There is fair evidence to support the rejection of the use of the procedure.
E. There is good evidence to support the rejection of the use of the procedure.

CLINICAL ALGORITHM(S)

None provided

EVIDENCE SUPPORTING THE RECOMMENDATIONS

TYPE OF EVIDENCE SUPPORTING THE RECOMMENDATIONS

The type of supporting evidence is identified and graded for each recommendation (see "Major Recommendations").

The recommendations given are based on the cumulative experience of the medical physics departments and phototherapists represented by the workshop contributors.

BENEFITS/HARMS OF IMPLEMENTING THE GUIDELINE RECOMMENDATIONS

POTENTIAL BENEFITS

Optimal patient treatment with ultraviolet (UV) radiation therapy

POTENTIAL HARMS

Risks of ultraviolet radiation treatment include under and over exposure of the patient to ultraviolet (UV) radiation

QUALIFYING STATEMENTS

QUALIFYING STATEMENTS

- These guidelines on recommendations for good practice have been prepared for medical physicists, dermatologists, and phototherapists, following a Workshop meeting of the British Photodermatology Group. Caution should be exercised in interpreting the data; the results of future studies may require alteration of the conclusions or recommendations in this report. It may be necessary or desirable to depart from the guidelines in special circumstances. Just as adherence to guidelines may not constitute defence against a claim of negligence, so deviation from them should not necessarily be deemed negligent.
- It is important that these guidelines are used appropriately in that they can only assist the practitioner and cannot be used to mandate, authorise, or outlaw treatment options. Of course it is the responsibility of the practising

clinician to interpret the application of guidelines, taking into account local circumstances.
- Guidelines are inherently a fluid, dynamic process and will be updated on the British Association of Dermatologists (BAD) Web site on a regular basis.

IMPLEMENTATION OF THE GUIDELINE

DESCRIPTION OF IMPLEMENTATION STRATEGY

An implementation strategy was not provided.

INSTITUTE OF MEDICINE (IOM) NATIONAL HEALTHCARE QUALITY REPORT CATEGORIES

IOM CARE NEED

Getting Better
Living with Illness

IOM DOMAIN

Effectiveness
Safety

IDENTIFYING INFORMATION AND AVAILABILITY

BIBLIOGRAPHIC SOURCE(S)

Taylor DK, Anstey AV, Coleman AJ, Diffey BL, Farr PM, Ferguson J, Ibbotson S, Langmack K, Lloyd JJ, McCann P, Martin CJ, Menage Hdu P, Moseley H, Murphy G, Pye SD, Rhodes LE, Rogers S. Guidelines for dosimetry and calibration in ultraviolet radiation therapy: a report of a British Photodermatology Group workshop. Br J Dermatol 2002 May;146(5):755-63. [19 references] PubMed

ADAPTATION

Not applicable: The guideline was not adapted from another source.

DATE RELEASED

2002 May

GUIDELINE DEVELOPER(S)

British Association of Dermatologists

SOURCE(S) OF FUNDING

British Association of Dermatologists

Financial support of the workshop was provided by Leo Pharmaceuticals.

GUIDELINE COMMITTEE

Not stated

COMPOSITION OF GROUP THAT AUTHORED THE GUIDELINE

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FINANCIAL DISCLOSURES/CONFLICTS OF INTEREST

Not stated

GUIDELINE STATUS

This is the current release of the guideline.

GUIDELINE AVAILABILITY

Electronic copies: Available in Portable Document Format (PDF) from the British Association of Dermatologists Web site.

AVAILABILITY OF COMPANION DOCUMENTS

The following is available:

- Griffiths CE. The British Association of Dermatologists guidelines for the management of skin disease Br J Dermatol. 1999 Sep;141(3):396-7.

Electronic copies: Available in Portable Document Format (PDF) from the British Association of Dermatologists Web site.

PATIENT RESOURCES

None available

NGC STATUS

This NGC summary was completed by ECRI on April 21, 2005. The information was verified by the guideline developer on August 2, 2005.

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